MNRAS **000**, 1–2 (2015) Preprint 10 October 2017 Compiled using MNRAS LaTeX style file v3.0

Warm molecules of tea: Molecular outflows in the Teacup Galaxy

Keith T. Smith,[1★] A. N. Other,[2] Third Author[2,3] and Fourth Author[3]
[1]*Royal Astronomical Society, Burlington House, Piccadilly, London W1J 0BQ, UK*
[2]*Department, Institution, Street Address, City Postal Code, Country*
[3]*Another Department, Different Institution, Street Address, City Postal Code, Country*

Accepted XXX. Received YYY; in original form ZZZ

ABSTRACT
Abstract

Key words: keyword1 – keyword2 – keyword3

1 INTRODUCTION

2 OBSERVATIONS AND DATA REDUCTION

We observed J1430+1339 with SINFONI on the Very Large Telescope (VLT). The observations were split into X observing blocks (OBs), the first of which was carried-out on the XX, with the last on the XX. Each OB consisted of XX 300 s on-target integrations, with each on-sky integration followed by a 300 s nod-to-sky to facilitate sky background removal. This gives a total on-target integration time of XX s.

The data from each OB was reduced separately using the standard SINFONI EsoRex pipeline. The output of EsoRex is a bias and flat-corrected, sky-subtracted, wavelength-calibrated datacube. For flux calibration, we observed flux standard stars which were reduced using the same EsoRex pipeline. The same standards were also used to correct for telluric absorption features. Following Ramos Almeida et al. (2017), we wrote our own Python pipeline to flux-calibrate and telluric-correct the science datacubes.[1] This pipeline models the standard as a blackbody with a temperature corresponding to its spectral type. It then integrates this model spectrum over the synthetic 2MASS Ks-band filter and normalises the corresponding model magnitude to match the 2MASS Ks-band magnitude. Next, it extracts the observed spectrum of the standard star (in counts s^{-1}) and fits telluric-free regions of its continuum with a fourth-order polynomial. The ratio of the normalised model blackbody spectrum and this polynomial fit gives the response of telescope, which we apply to the science datacube. Telluric correction is performed by multiplying the science flux-calibrated datacube by the ratio of the corrected standard spectrum to the normalised model blackbody spectrum.

After flux calibration and telluric correction, each science datacube was aligned such that the peak flux (in an image collapsed along the spectral dimension) lay at the centre of the image. We do not perform sub-pixel centroiding since the seeing PSF is significantly larger than the pixel size. After alignment, the calibrated datacubes from each OB are mean-combined with sigma clipping to produce our final science datacube.

3 RESULTS

As shown by Ramos Almeida et al. (2017), the most striking feature of J1430+1339 in infrared spectroscopy is the kinematically complex Paα line that extends to the top North-Eastern corner of our datacube. This corresponds to a physical scale of XXX pc and coincides with the portion of the extended "bubble" that covered by our SINFONI observations.

Simple mathematics can be inserted into the flow of the text e.g. $2 \times 3 = 6$ or $v = 220\,\mathrm{km\,s^{-1}}$, but more complicated expressions should be entered as a numbered equation:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}. \quad (1)$$

Refer back to them as e.g. equation (1).

3.1 Figures and tables

Figures and tables should be placed at logical positions in the text. Don't worry about the exact layout, which will be handled by the publishers.

Figures are referred to as e.g. Fig. **??**, and tables as e.g. Table **??**.

4 CONCLUSIONS

The last numbered section should briefly summarise what has been done, and describe the final conclusions which the authors draw from their work.

ACKNOWLEDGEMENTS

The Acknowledgements section is not numbered. Here you can thank helpful colleagues, acknowledge funding agencies, telescopes and facilities used etc. Try to keep it short.

★ E-mail: mn@ras.org.uk (KTS)
[1] All our software is available at `https://github.com/SheffAGN/SINFONI_outflows`.

© 2015 The Authors

REFERENCES

Ramos Almeida C., Piqueras López J., Villar-Martín M., Bessiere P. S., 2017, MNRAS, 470, 964

APPENDIX A: SOME EXTRA MATERIAL

If you want to present additional material which would interrupt the flow of the main paper, it can be placed in an Appendix which appears after the list of references.

This paper has been typeset from a TEX/LATEX file prepared by the author.